Intellectual Property Administration
P. O. Box 272400
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 10014423 -1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Robert G. Gann et al — Confirmation No.: 2734

Application No.: 09/845391 — Examiner: Hannett, James M

Filing Date: Apr 30, 2001 — Group Art Unit: 2612

Title: Image Scanner Photosensor Assembly With Improved Spectral Accuracy And Increased Bit-Depth

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 09/02/2005.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) $500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( )	one month	$120.00
( )	two months	$450.00
( )	three months	$1020.00
( )	four months	$1590.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of $500.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

( ) I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313-1450. Date of Deposit: ________

OR

(X) I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number (571) 273-8300 on Sept. 2, 2005

Number of pages: 17

Typed Name: Donna M Kraft

Signature: Donna M Kraft

Respectfully submitted,

Robert G. Gann et al

By A. W. Winfield

Augustus W Winfield

Attorney/Agent for Applicant(s)
Reg. No. 34,046

Date: Sept. 2, 2005

Telephone No.: 970 898 3142

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Mail Stop 35
Fort Collins, Colorado 80527-2400

PATENT APPLICATION

ATTORNEY DOCKET NO. 10014423-1

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Robert G. Gann

Serial No.: 09/845,391 **Examiner:** Hannett, James M

Filing Date: 04/30/2001 **Group Art Unit:** 2612

Title: Image Scanner Photosensor Assembly With Improved Spectral Accuracy and Increased Bit-Depth

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria VA 22313-1450

RECEIVED
CENTRAL FAX CENTER
SEP 0 2 2005

BRIEF ON APPEAL

INTRODUCTION

Pursuant to the provisions of 37 CFR Part 41, Subpart B, applicants hereby appeal to the Board of Patent Appeals and Interferences (the "Board") from the examiner's final rejection dated 06/02/2005. A notice of appeal was timely filed on 09/02/2005, concurrent with this brief on appeal, in accordance with 37 CFR § 41.31(a)(1).

REAL PARTY IN INTEREST

The entire interest in the present application has been assigned to Hewlett-Packard Development Company, L.P. as recorded at reel 014061, frame 0492.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

RECEIVED
OIPE/IAP
SEP 0 6 2005

09/06/2005 SSESHE1 00000103 082025 09845391
01 FC:1402 500.00 DA

STATUS OF CLAIMS

Claims 1-6 and 8-9 are pending in the application.

Claims 1-6 and 8-9 are finally rejected.

Claims 1-6 and 8-9 are on appeal.

STATUS OF AMENDMENTS

There are no after-final amendments.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention relates generally to photosensor arrays used in image scanners, copiers, and facsimile machines. In one example embodiment, one row of a staggered line array of photosensors receives light having a first spectral bandwidth, and a second row of the staggered line array receives light having a different spectral response (figures 1 and 4; page 6, line 27 through page 7, line 25). In a second example embodiment, photosensors with different sizes receive light having different spectral bandwidths (figures 2-4; page 9, lines 3 through 23).

Claim 1 specifies a photosensor assembly, comprising: a plurality of sets of lines of photosensors (figure 1), each set comprising at least a first line (100, 104, 108) and a second line (102, 106, 110), where photosensors in the first line and the second line have substantially the same pitch, and where photosensors in the first line are offset relative to photosensors in the second line by approximately one-half the pitch, and where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the light received by the second line (page 7, lines 11-18).

Claim 2, dependent on claim 1, further specifies: N lines of photosensors, where N is at least six (figure 1), each photosensor in one of the N lines receiving a different spectral bandwidth of light than photosensors in the other N-1 lines.

Claim 3 specifies a photosensor assembly, comprising: a plurality of sets of lines of photosensors (figure 1), each set comprising at least a first line (100, 104, 108) and a

second line (102, 106, 110), where photosensors in the first line and the second line have substantially the same photosensor width, and where photosensors in the first line are offset relative to photosensors in the second line by approximately one-half the photosensor width, and where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the light received by the second line (page 7, lines 11-18). [*Note: figure 1 is simplified in that there is no spacing illustrated between adjacent photosensors. With spacing between adjacent photosensors then pitch is different than width*]

Claim 4 specifies: a photosensor assembly as in claim 3, further comprising: N lines of photosensors, where N is at least six (figure 1), each photosensor in one of the N lines receiving a different spectral bandwidth of light than photosensors in the other N-1 lines.

Claim 5 specifies: a photosensor assembly (figure 2), comprising: N first lines of photosensors having a first size (200, 202, 204); M second lines of photosensors having a second size (206, 208, 210); where M and N are both greater than one; where the second size is different than the first size; where, within each line of photosensors, essentially all photosensors receive the same spectral bandwidth of light; and where at least M+N different spectral bandwidths of light are received (page 9, lines 3 - 28).

Claim 6 specifies a method of scanning, comprising: scanning an area with N lines of photosensors, where N is even and at least six, where each line of photosensors has a corresponding line of photosensors that is spatially offset by substantially one-half a pitch of the photosensors, and where each of the lines of photosensors receives a different spectral bandwidth of light (page 6, line 27 through page 7, line 25).

Claim 8 specifies a method of scanning, comprising: scanning an area with N photosensors, where N is even and at least six, where some the photosensors are a first size and the remaining photosensors are a second size, and the first and second sizes are different, and where each of the photosensors receives a different spectral bandwidth of light; obtaining M bits of intensity data from each photosensor; and combining the intensity data to obtain M times N bits of intensity data for the area (page 8, line 18, through page 9, line 2; page 10, lines 15 – 27).

Claim 9, dependent on claim 8, further comprises: using a transformation matrix to reduce the M times N bits of intensity data to M times N/2 bits of intensity data (page 8, line 21 through page 9, line 2).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-4 and 6 are unpatentable under 35 U.S.C. § 103 over U.S. Patent Number 6,570,615 (Decker *et al.*) in view of U.S. Patent Number 5,025,282 (Nakamura *et al.*).

2. Whether claims 5 and 8-9 are unpatentable under 35 U.S.C. § 103 over Decker *et al.* in view of Nakamura *et al.*, in further view of U.S. Patent Number 5,652,664 (Kuska *et al.*).

ARGUMENT

CLAIMS 1-4 AND 6, FIRST ARGUMENT

Claims 1, 3, and 6 specify a photosensor assembly, comprising a plurality of sets of staggered lines of photosensors, each set comprising at least a first line and a second line, and where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the light received by the second line. A combination of Decker *et al.* and Nakamura *et al.* does not teach or suggest sets of staggered lines where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the light received by the second line.

From MPEP 2143.03: To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

Decker *et al.* teach the structure of staggered line arrays, which applicant stipulated as prior art in the application at page 7, lines 4-5. Decker *et al.* do not teach or suggest that

a spectral bandwidth of light received by a first line may be different than the spectral bandwidth of light received by a second line.

Nakamura *et al.* teach an image forming apparatus receiving six different spectral bandwidths, but do not teach or suggest any particular sensor structure.

A combination of Decker *et al.* and Nakamura *et al.* teaches only the general structure of staggered line arrays and receiving six spectral bandwidths, but that general teaching does not teach or suggest the specific limitation of receiving a different spectral bandwidth by each line in a staggered array.

In the office action dated 06/02/2005, at pages 2 and 4, the examiner stipulates that Decker *et al.* do not teach that the spectral sensitivities of two lines a set may be different from each other, and concludes without support on page 5 that it would be obvious to make the six lines of photosensors in the scanner of Decker *et al.* to have six different spectral sensitivities as taught by Nakamura *et al.* Decker *et al.* teach that each of the two lines of a staggered array receive the same spectral bandwidth. Since both lines of a set in Decker *et al.* receive the same spectral bandwidth, then a combination of Decker *et al.* and Nakamura *et al.* suggests six staggered pairs of lines, with each line of each pair receiving the same spectral bandwidth. There is no teaching or suggestion in a combination of Decker *et al.* and Nakamura *et al.* that it is OK for each line of a staggered pair of lines to receive a different bandwidth. That idea is taught only in the present application.

CLAIMS 1-4 AND 6, SECOND ARGUMENT

From MPEP 2143.01: If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

Modifying Decker *et al.* to receive a different spectral bandwidth on each line of a pair of lines would render the system of Decker *et al.* unsatisfactory for its intended purpose. Note in the present application at page 7, line 26 through page 8, line 17, if the two lines of a staggered array receive different spectral bandwidths, then the assembly

generates two separate images. Decker *et al.*, do not teach or suggest that two separate images would be satisfactory in full-resolution mode.

CLAIM 5

Claim 5 specifies: a photosensor assembly (figure 2), comprising: N first lines of photosensors having a first size; M second lines of photosensors having a second size; where M and N are both greater than one; where the second size is different than the first size; where, within each line of photosensors, essentially all photosensors receive the same spectral bandwidth of light; and where at least M+N different spectral bandwidths of light are received.

In the office action dated 06/02/2005, at page 8, the examiner cites Decker *et al.*, column 4, lines 41-67 and column 5, lines 1-17 as teaching photosensors of two different sizes. The cited text does not support the assertion. There is nothing in the cited text or elsewhere in Decker *et al.* teaching or suggesting photosensors of two different sizes. Furthermore, at the bottom of page 8, the examiner stipulates that Decker *et al.* in view of Nakamura *et al.* <u>does not</u> teach that the photosensors in the second rows are a different size than the photosensors in the first rows.

Kusaka *et al.* teach an array having two different sizes of photosensors, and applicant stipulated that arrays having two different sizes of photosensors were known in the prior art (page 9, lines 7-9). Kusaka *et al.* are concerned with autofocus, not color, and they do not teach or suggest anything about spectral bandwidths of light being received by the photosensors.

In the office action dated 06/02/2005, at page 9, the examiner asserts that it would be obvious to modify Decker *et al.* to make the second rows of the staggered arrays a different size, and on page 8 the examiner asserts as for claim 1 that it would be obvious for each row in a staggered pair to receive a different spectral bandwidth. At page 9 of the office action, the examiner argues that it would be obvious to modify Decker *et al.* to increase image quality and to improve focus in both low light and high brightness conditions.

A combination of Decker *et al.*, Nakamura *et al.*, and Kuska *et al.* does not teach or suggest anything about how spectral bandwidths would be assigned to staggered arrays and does not teach anything about how spectral bandwidths would be assigned to photosensors of different sizes. Regarding modifying Decker *et al.* so that each row in a staggered row receives a different spectral bandwidth, the arguments presented by the applicant above in conjunction with claims 1-4 and 6 apply equally to claim 5.

From MPEP 2143.01: Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching or suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). In addition, from MPEP 2143.01: The mere fact that references <u>can</u> be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

There is no explicit teaching to modify Decker *et al.* to have different size photosensors in each row in a staggered row. Regarding any implicit teaching or desirability, the examiner has stated a problem to be solved or desire that does not exist. That is, there is no teaching or suggestion in the prior art that improvement in focus in low light and high brightness conditions is a problem that needs to be solved in an environment where a staggered sensor array would be used (for example, an image scanner). Note in particular that the image scanner of Decker *et al.* has a fixed focus and a constant light source, so there is no motivation to modify the sensor array of Decker *et al.* Finally, the examiner provides no technical support or argument for the assertion that staggered rows of different sizes would improve image quality.

CLAIMS 8 AND 9

Claim 8 specifies a method of scanning, comprising: scanning an area with N photosensors, where N is even and at least six, where some the photosensors are a first size

and the remaining photosensors are a second size, and the first and second sizes are different, and where each of the photosensors receives a different spectral bandwidth of light; obtaining M bits of intensity data from each photosensor; and combining the intensity data to obtain M times N bits of intensity data for the area. A combination of Decker *et al.*, Nakamura *et al.*, and Kuska *et al.* does not teach or suggest scanning an area with different size photosensors receiving different spectral bandwidths and combining the data from the different size photosensors.

Regarding Decker *et al.* and photosensors of different sizes, the arguments presented by the applicant above in conjunction with claim 5 apply equally to claim 8.

In the office action dated 06/02/2005, at page 10, the examiner cites Kusaka *et al.*, column 6, lines 8-50. The cited text states that one size photosensor is used at one light level, and the other size at a different light level. In particular, there is no teaching or suggestion that information from both sizes of photosensors is combined for any one focus measurement. There is no teaching or suggestion in a combination of Decker *et al.*, Nakamura *et al.*, and Kuska *et al.* to combine information from two different sizes of pixels during one scan.

In the office action dated 06/02/2005, at page 11, regarding claim 8, the examiner states that it would be obvious to modify the staggered arrays of Decker *et al.* so that the second rows have different size photosensors than the first rows to increase image quality and better focus in both low light and high brightness. Assume for the sake of argument that is examiner is correct, the examiner's assertion does not include all the limitations of claim 8. Specifically, no argument has been presented for combining information from two different sizes of photosensors during one scan. No *prima facie* case for obviousness has been established.

CONCLUSION

In view of the above, applicant respectfully requests that the examiner's rejection of claims 1-6 and 8-9 be reversed.

Respectfully submitted,

Augustus W. Winfield

Reg. No. 34,046

September 2, 2005

Fort Collins, CO 80528-9599

(970) 898-3142

CLAIMS APPENDIX

1. A photosensor assembly, comprising:

   a plurality of sets of lines of photosensors, each set comprising at least a first line and a second line, where photosensors in the first line and the second line have substantially the same pitch, and where photosensors in the first line are offset relative to photosensors in the second line by approximately one-half the pitch, and where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the light received by the second line.

2. A photosensor assembly as in claim 1, further comprising:

   N lines of photosensors, where N is at least six, each photosensor in one of the N lines receiving a different spectral bandwidth of light than photosensors in the other N-1 lines.

3. A photosensor assembly, comprising:

   a plurality of sets of lines of photosensors, each set comprising at least a first line and a second line, where photosensors in the first line and the second line have substantially the same photosensor width, and where photosensors in the first line are offset relative to photosensors in the second line by approximately one-half the photosensor width, and where the spectral bandwidth of light received by the first line is different than the spectral bandwidth of the light received by the second line.

4. A photosensor assembly as in claim 3, further comprising:

   N lines of photosensors, where N is at least six, each photosensor in one of the N lines receiving a different spectral bandwidth of light than photosensors in the other N-1 lines.

5. A photosensor assembly, comprising:

N first lines of photosensors having a first size;

M second lines of photosensors having a second size;

where M and N are both greater than one;

where the second size is different than the first size;

where, within each line of photosensors, essentially all photosensors receive the same spectral bandwidth of light; and

where at least M+N different spectral bandwidths of light are received.

6. A method of scanning, comprising:

scanning an area with N lines of photosensors, where N is even and at least six, where each line of photosensors has a corresponding line of photosensors that is spatially offset by substantially one-half a pitch of the photosensors, and where each of the lines of photosensors receives a different spectral bandwidth of light.

8. A method of scanning, comprising:

scanning an area with N photosensors, where N is even and at least six, where some the photosensors are a first size and the remaining photosensors are a second size, and the first and second sizes are different, and where each of the photosensors receives a different spectral bandwidth of light;

obtaining M bits of intensity data from each photosensor; and

combining the intensity data to obtain M times N bits of intensity data for the area.

9. The method of claim 8, further comprising:

using a transformation matrix to reduce the M times N bits of intensity data to M times N/2 bits of intensity data.

EVIDENCE APPENDIX

Does not apply

THIS PAGE BLANK (USPTO)

RELATED PROCEEDINGS APPENDIX

None